



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/761,058	01/20/2004	Zhaohui Sun	87579RLW	2004

7590 04/25/2008  
Mark G. Bocchetti  
Patent Legal Staff  
Eastman Kodak Company  
343 State Street  
Rochester, NY 14650-2201

EXAMINER
----------

ANYIKIRE, CHIKAODILI E

ART UNIT	PAPER NUMBER
----------	--------------

2621

MAIL DATE	DELIVERY MODE
-----------	---------------

04/25/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/761,058	<b>Applicant(s)</b> SUN, ZHAOHUI	
	<b>Examiner</b> CHIKAODILI E. ANYIKIRE	<b>Art Unit</b> 2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 30 January 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 28-36 is/are pending in the application.
- 4a) Of the above claim(s) 1-27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 28-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Response to Arguments*

1. Applicant's arguments with respect to claims 28-36 have been considered but are moot in view of the new ground(s) of rejection.
2. Claims 1-27 are cancelled. Claims 28-36 are rejected.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
5. Claims 28 and 33-36 rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada (US 5,543,855) in view of Tanaka et al (US 6,148,101).

As per **claim 28**, Yamada et al discloses a method implemented at least in part by a computer for facilitating the reduction tone scale of a video, said video having a

plurality of frames, each of the frames having a plurality of pixels, the method comprising the steps of:

determining a quantization error of a base pixel of a current frame of said video (Abstract and Col 2 Ln 52-67 and Col 3 Ln 55-62);

diffusing at least some of said quantization error to one or more pixels of a video frame (Fig 3, element 107; Col 4 Ln 10-41)

storing information associated with the diffusing in a computer-readable storage medium (Col 5 Ln 29-40).

However, Yamada et al does not explicitly teach using frames that are temporally neighboring to said current frame.

In the same field of endeavor, Tanaka et al teaches of using frames that are temporally neighboring to said current frame (Fig 13, element 108; Col 27 Ln 19-22).

Therefore, it would have been obvious for one having ordinary skill in the art at the time of invention was made to modify the modified invention of Yamada et al with the invention of Tanaka et al that discloses using frames that are temporally neighboring said current frame. The advantage of the invention of Tanaka et al is that it provides more efficient coding between frames in order to accurately process scene changes (Col 25 Ln 45-60).

As per **claim 30**, Yamada et al disclose the method of claim 28, wherein the threshold is adaptively adjust at least by:

generating a gain control map (Fig 2, element 33, masking unit) and a temporal diffusion map (diffusion matrix) from at least said motion field (Fig 3, 107; Col 4 Ln 12-23); and

applying said map during said determining and diffusing steps, respectfully (Col 3 Ln 50 – Col 4 Ln 22).

However, Yamada et al does not explicitly teach determining a motion field between at least said current frame and said temporally neighboring a video frame.

In the same field of endeavor, Tanaka et al teach determining a motion field between at least said current frame and said temporally neighboring a video frame (Fig 13, element 108; Col 27 Ln 19-22).

Therefore, it would have been obvious for one having ordinary skill in the art at the time of invention was made to modify the modified invention of Yamada et al with the invention of Tanaka et al that consists of determining a motion field between at least said current frame and said temporally neighboring a video frame. The advantage of the invention of Tanaka et al is that it provides more efficient coding between frames in order to accurately process scene changes (Col 25 Ln 45-60).

As per **claim 33**, Yamada et al disclose the method of claim 28.

However, Yamada et al does not explicitly teach diffusing is along motion trajectories.

In the same field of endeavor, Tanaka et al teach along motion trajectories (Col 27 Ln 19-22 and Col 30 Ln 15-19).

Therefore, it would have been obvious for one having ordinary skill in the art at the time of invention was made to modify the modified invention of Yamada et al with the invention of Tanaka et al that consists of motion trajectories. The advantage of the invention of Tanaka et al is that it provides more efficient coding between frames in order to accurately process scene changes (Col 25 Ln 45-60).

As per **claim 34**, Yamada et al disclose the method of claim 28, wherein said threshold is adaptively adjusted based at least upon a function of initial tone values of said base pixel (Col 3 Ln 50-55 and Col 5 Ln 3-15).

However, Yamada et al does not explicitly teach temporally neighboring pixels at the same spatial location in the temporally neighboring video frame.

In the same field of endeavor, Tanaka et al teach temporally neighboring pixels at the same spatial location in the temporally neighboring video frame (Col 27 Ln 19-22).

Therefore, it would have been obvious for one having ordinary skill in the art at the time of invention was made to modify the modified invention of Yamada et al with the invention of Tanaka et al that consists of temporally neighboring pixels at the same spatial location in the temporally neighboring vide frame. The advantage of the invention of Tanaka et al is that it provides more efficient coding between frames in order to accurately process scene changes (Col 25 Ln 45-60).

Regarding **claim 35**, arguments analogous to those presented for claim 28 are applicable for claim 35.

Regarding **claim 36**, arguments analogous to those presented for claim 28 are applicable for claim 36.

6. Claims 29 and 32 rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada (US 5,543,855) in view of Tanaka et al (US 6,148,101) in further view of Damera-Vankata et al, "Adaptive Threshold Modulation for Error Diffusion Halftoning".

As per **claim 29**, Yamada et al disclose the method of claim 28, further comprising repeating the determining and diffusing steps for multiple pixels in the current frame, where the quantization error for each of the multiple pixels is determined (Fig 4 and 5; Col 5 Ln 3-15).

However, Yamada et al does not explicitly teach at least by utilizing an adaptively adjusted threshold.

In the same field of endeavor, Damera-Vankata et al teach utilizing an adaptively adjusted threshold (Section 2B, Section 3, and Section 4).

Therefore, it would have been obvious for one having ordinary skill in the art to have modified the invention of Yamada et al with the invention of Damera-Venkata et al that consists of utilizing an adaptively adjusted threshold. The adaptive threshold minimizes the distortion in the halftone.

As per **claim 32**, the modified invention of Yamada et al disclose the method of claim 29, wherein said threshold is adaptively adjusted based at least upon a function of motion between said current frame and temporally neighboring frame (Tanaka et al , Col 27 Ln 19-22).

7. Claim 31 rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada (US 5,543,855) in view of Tanaka et al (US 6,148,101) in further view of Mulligan, Jeffrey B, "Spatiotemporal Dithering".

As per **claim 31**, Yamada et al disclose the method of claim 30.

However, Yamada et al does not explicitly teach applying a finite impulse response filter to said motion fields.

In the same field of endeavor, Mulligan teaches wherein said generating further comprises applying a finite impulse response filter to said motion fields (Mulligan, Section 3.3; paragraph 2 Ln 8-11).

Therefore, it would have been obvious at the time of the invention to modify the invention of modified Yamada et al in view of the invention Mulligan that consist of a finite impulse response filter to said motion fields. The advantage of the modification is that iterative algorithms are designed to find the visually optimal halftone.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).



A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHIKAODILI E. ANYIKIRE whose telephone number is (571)270-1445. The examiner can normally be reached on Monday to Friday, 7:30 am to 5 pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha D. Banks-Harold can be reached on (571) 272 - 7905. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2621

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/CEA/

/Andy S. Rao/

Primary Examiner, Art Unit 2621

April 23, 2008